What is claimed is:

1. A nanocomposite material comprising
   a) a synthetic polymer,
   b) a natural or synthetic phyllosilicate or a mixture of such phyllosilicates in nanoparticles,
   c) a phenolic antioxidant and/or a processing stabilizer, and
   d) a mono or polyfunctional compound selected from the class consisting of the epoxides, oxazolines, oxazolones, oxazines, isocyanates and/or anhydrides.

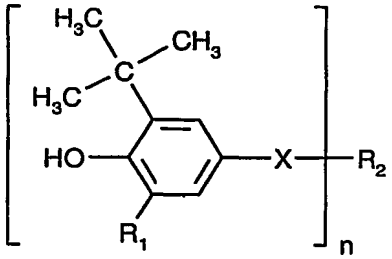
2. A nanocomposite material according to claim 1, wherein component (a) is a polyolefin.

3. A nanocomposite material according to claim 1, wherein component (b) is a layered silicate clay in nanoparticles.

4. A nanocomposite material according to claim 1, wherein component (b) is a montmorillonite, bentonite, beidelite, mica, hectorite, saponite, nontronite, sauconite, vermiculite, ledikite, magadite, kenyaite, stevensite, volkonskoite or a mixture thereof in nanoparticles.

5. A nanocomposite material according to claim 1, wherein component (b) is modified by an ammonium or phosphonium compound.

6. A nanocomposite material according to claim 1, wherein the phenolic antioxidant as component (c) is a compound of the formula I

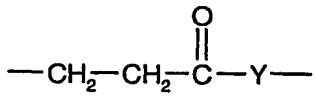
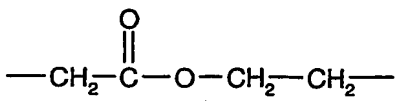


(I)

in which

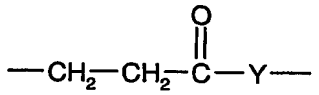
R_1 is C_1-C_4alkyl,

n is 1, 2, 3 or 4,

X is methylene,  or  ,

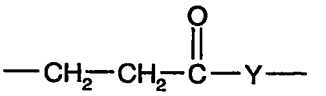
Y is hydrogen or -NH-; and,

if n is 1,

X is  , where Y is attached to R_2, and

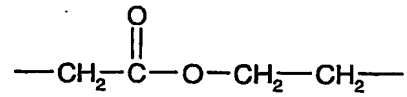
R_2 is C_1-C_{25}alkyl; and,

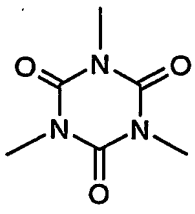
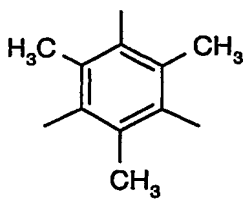
if n is 2,

X is  , where Y is attached to R_2, and

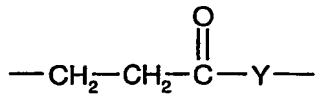
R_2 is C_2-C_{12}alkylene, C_4-C_{12}alkylene interrupted by oxygen or sulfur; or, if Y is -NH-, R_2 is additionally a direct bond; and,

if n is 3,

X is methylene or  , where the ethylene group is attached to R_2, and

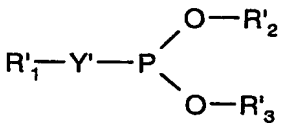
R_2 is  or  , and,

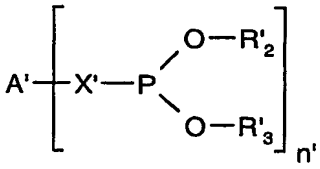
if n is 4,

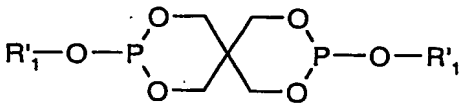
X is  , where Y is attached to R_2, and

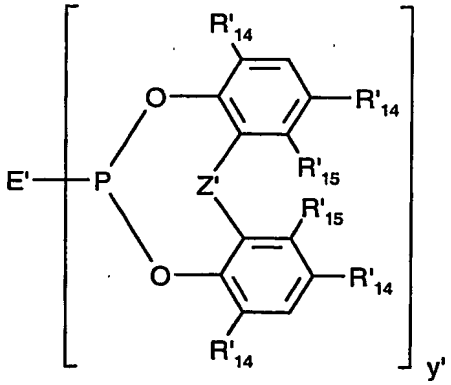
R_2 is C_4-C_{10}alkanetetrayl.

7. A nanocomposite material according to claim 1, wherein the processing stabilizer as component (c) is a compound of the formula II, III, IV or V

(II) 

 (III)

 (IV)

 (V)

in which

n' is the number 2 and y' is the number 1, 2 or 3;

A' is C_2-C_{18}alkylene, p-phenylene or p-biphenylene,

E', if y' is 1, is C_1-C_{18}alkyl, -OR'_1 or fluorine;

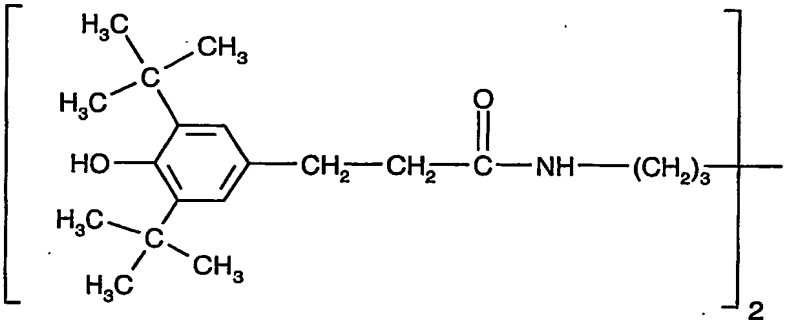
E', if y' is 2, is p-biphenylene,

E', if y' is 3, is $N(CH_2CH_2O\text{-})_3$,

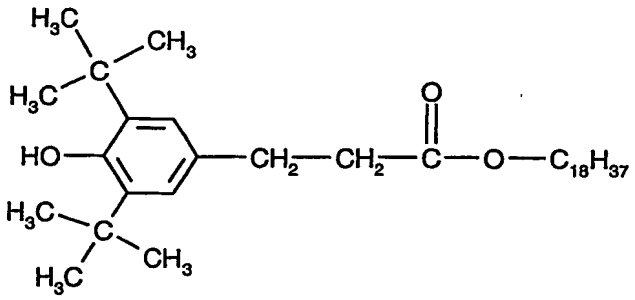
R'_1, R'_2 and R'_3 independently of one another are C_1-C_{18}alkyl, C_7-C_9phenylalkyl, cyclohexyl, phenyl, or phenyl substituted by 1 to 3 alkyl radicals having in total 1 to 18 carbon atoms;

R'_{14} is hydrogen or C_1-C_9alkyl,
R'_{15} is hydrogen or methyl;
X' is a direct bond,
Y' is oxygen,
Z' is a direct bond or -CH(R'_{16})-, and
R'_{16} is C_1-C_4alkyl; or a benzofuran-2-one.

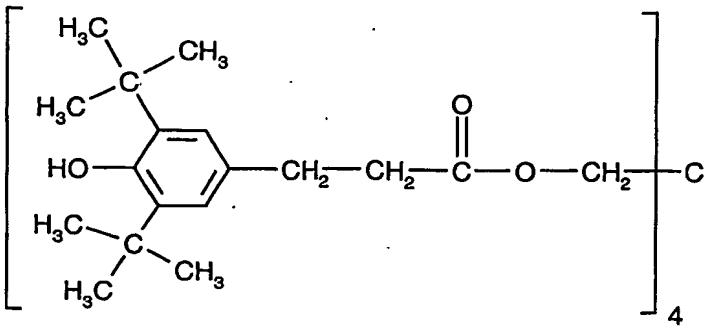
8. A nanocomposite material according to claim 1, wherein component (c) is tris(2,4-di-tert-butylphenyl) phosphite, bis(2,4-di-tert-butyl-6-methylphenyl) ethyl phosphite, bis(2,4-di-tert-butylphenyl) pentaerythritol diphosphite, tetrakis(2,4-di-tert-butylphenyl) 4,4'-biphenylenediphosphonite, 3-(3,4-dimethylphenyl)-5,7-di-tert-butylbenzofuran-2-one, 3-(2,3-dimethylphenyl)-5,7-di-tert-butylbenzofuran-2-one, and/or a compound of the formula Ia, Ib, Ic, Id or Ig



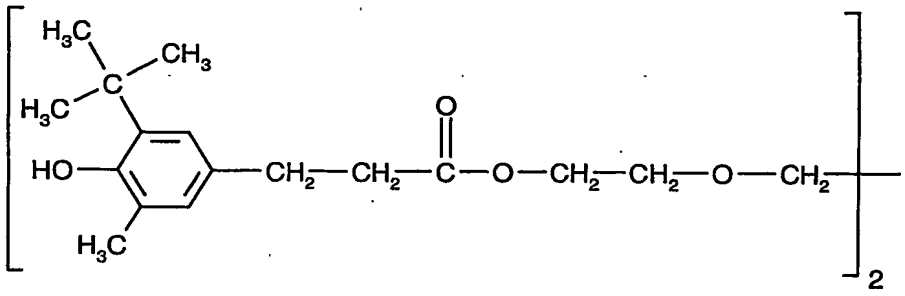
(Ia)



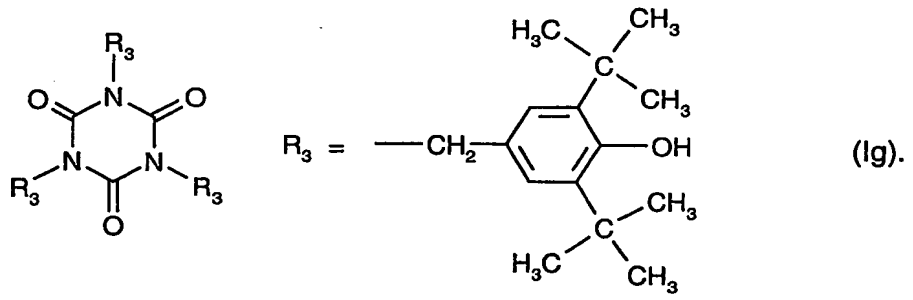
(Ib)



(Ic)



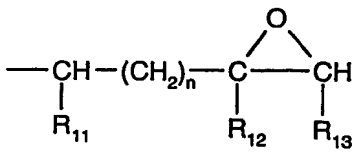
(Id)



(Ig).

9. A nanocomposite material according to claim 1, wherein component (d) is an epoxide.

10. A nanocomposite material according to claim 1, wherein component (d) is a polyfunctional epoxide which comprises epoxide radicals of the formula E-1



(E-1)

which are attached directly to carbon, oxygen, nitrogen or sulfur atoms, and wherein R_{11} and R_{13} are both hydrogen, R_{12} is hydrogen or methyl and n is 0; or wherein R_{11} and R_{13} together are $-CH_2CH_2-$ or $-CH_2CH_2CH_2-$, R_{12} is then hydrogen, and n is 0 or 1.

11. A nanocomposite material according to claim 1, wherein component (d) is bisphenol A diglycidyl ether, bisphenol F diglycidyl ether, diglycidyl 1,2-cyclohexanedicarboxylate or phenol novolak epoxy resin.

12. A nanocomposite material according to claim 1, wherein component (b) is present in an amount of from 0.01 to 30 %, based on the weight of component (a).

13. A nanocomposite material according to claim 1, wherein component (c) is present in an amount of from 0.01 to 5 %, based on the weight of component (a).

14. A nanocomposite material according to claim 1, wherein component (d) is present in an amount of from 0.01 to 5 %, based on the weight of component (a).

15. A nanocomposite material according to claim 1, comprising in addition, besides components (a), (b), (c) and (d), further additives.

16. A nanocomposite material according to claim 15, comprising as further additives modification agents for nanocomposites, compatibilizers, light-stabilizers, dispersing or solvating agents, pigments, dyes, plasticizers and/or toughening agents.

17. A nanocomposite material according to claim 15, comprising as further additives modifycation agents for nanocomposites, compatibilizers and/or metal passivators.

18. A nanocomposite material according to claim 1 in the form of a masterbatch comprising component (b) in an amount of from 0.03 to 90 %, based on the weight of component (a), component (c) in an amount of from 0.03 to 15 %, based on the weight of component (a), and component (d) in amount of from 0.03 to 15 %, based on the weight of component (a).

19. A process for stabilizing a synthetic polymer against oxidative, thermal or light-induced degradation, which comprises incorporating in or applying to said material at least one each of components (b), (c) and (d) according to claim 1.

20. The use of a mixture of components (b), (c) and (d) according to claim 1 as stabilizers for synthetic polymers against oxidative, thermal or light-induced degradation.